

AD-3: Redesign Terminal Airspace and Routes

Current congestion in transition and en route airspace often limits the ability to get departing aircraft off the ground. Similarly, airspace congestion can limit arrivals, even if runway capacity is available. In many terminal areas today, arrival and departure procedures overlap either because they were designed for lower volumes and staffing, or because they are based on ground-based navigation. These routes are strongly interdependent. Many airports have common departure fixes or arrival fixes that must service a variety of aircraft types with different performance characteristics. By requiring departures to navigate or funnel through common departure fixes, the throughput rates at the airports involved must be suppressed. Similar problems exist with arrivals.

Terminal airspace optimization and redesign is a foundation component of the National Airspace redesign. Terminal airspace optimization efforts are ongoing initiatives to ensure the airspace design and use is effective for transitioning aircraft to and from the associated airport or airports. Terminal airspace redesign is a major undertaking to develop a structure that takes full advantage of evolving technologies and aircraft capabilities. This redesign will provide flexibility for system users to efficiently transition into and out of terminal airspace while making maximum use of airspace and airport capacity.

Where volume has increased and the current airspace structure is the limiting factor, redesigning these procedures, including the addition of RNAV procedures, will allow for more efficient use of the constrained terminal airspace. Area Navigation, or RNAV, is a method of navigation that permits aircraft operations on any desired course within the coverage of station referenced navigation signals or within the limits of self contained system capability or combination of these. The acronym “RNAV” has been adopted by industry as an umbrella term that encompasses any procedure or operation that utilizes point to point navigation, from ground or air-based/space-based sources. The expectation is that in the future, this will evolve away from dependence on ground-based navigation resources. This is manifested through use of on-board avionics and flight management systems (FMS).

RNAV technologies offer several operational improvements:

- RNAV procedures in terminal airspace can reduce complexity and increase efficiency in the near and mid-term. When designed collaboratively, the procedures require minimal vectoring and/or communications between the flight crews and the ATC controllers. These procedures can be used to reduce voice communications associated with speed and altitude instructions, freeing up more controller time. The procedure, when implemented, describes a flight path that includes position, altitude, and time.
- Reducing spacing on the arrival route structures to the existing separation standards can be accomplished in the long-term through pre-planned navigation routes and speed control techniques (planned for 50 airports). This concept deals with developing procedures that include the assignment of altitudes and speeds at waypoints located along the FMS/RNAV procedure.